La Jolla,Cal.

Jan.2nd 1919.

La Jolla.

Mr.Chas.E.Gore,

235 Maine St.,

Long Beach,Cal.

My dear Mr.Gore:

At the present time kelp matters are so in the air that I do not feel like giving any advice whatever. The market for dried or ashed kelp seems to be a falling market and the companies that are now in the business seem yo be more or less dubious about continuing.

For information concerning the possibilities of new by-products from,kelp, I should advise you to write Dr.J.W.Turrentine, Federal Experimental Kelp Plant, Summerland,Cal.

I shall be pleased to see you here at any time. I am sure when I shall be in Long Beach or San Pedro again.

Sincerely yours,

W.C.Crandall

La Jolla, Cal.

Jan. 20th 1919.

Dr J. W. Turrentine,

Santa Barbara, Cal.

My dear Dr. Turrentine:

Enclosed are some letters received from Bonfield of Hercules Powder Co. It is impossible for the Scripps Institution to do anything with the proposition now as funds are at a low ebb and we do not feel that we can successfully stop any of our present work. This work is in direct line with your work and I know you are after it. I am accordingly sending these letters as they may have one or two definite points in them that you may want. I am osrry that Bonfield did not include the letter to Sherwood that is mentioned as that leaves out the most important set of facts asked for.

Hoping that all your good schemes for cleaning up this much discussed and now distressed subject pan out in good shape, I am

Very truly yours

W. A. Landacre

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS.
INVESTIGATION OF FERTILIZER RESOURCES.
EXPERIMENTAL PLANT FOR THE EXTRACTION OF POTASH FROM KELP.
SUMMERLAND, CALIFORNIA.

January 22, 1919.

Capt. W. C. Crandall,
Scripps Biological Institute,
La Jolla, California.

Dear Captain:

Replying to your good favor of the 20th instant, permit me to say that I have been in correspondence with Mr. Berkeley relative to his transfer to this organization for the continuation of his study of the fermentation of kelp. His citizenship stands in the way of his permanent appointment. Since as a foreigner I could not keep him on our pay rolls longer than a six months period and such a short time, of course, would not make it worth while, I have written to Washington to see what could be done in the way of a special dispensation. Until I find that out, I will not be able to make any move.

Thanking you for bringing the matter to my attention, and with kind personal regards, I am

Yours very sincerely,

J W Turrentine

In Charge.

JWT:ELB

Oakland, Cal., Feb. 21, 1919.

Prof. W. C. Crandall,
La Jolla,
California.

Dear Sir:

The undersigned is very much interested indeed in any information relative to the saving of the by-products of sea kelp.

Could you suggest a method of treating or give an authority who would be quite reliable on the inexpensive treating of this product so as to save all of the cellular portion in simply a pulp form and effect the separation by an inexpensive chemical process?

If you can do this, I will surely appreciate it.

Further, if you have any later data in regard to how you view the future outlook of the potash from kelp industry, I will greatly appreciate your suggestions.

Yours very truly,

F. W. Allen

FAW:D

Feb.25th 1919.

F.A.Williamson,

Oakland,Cal.

Dear Sir;

The by-products of kelp information can best be secued by writing to Dr.Turrentine, Federal Kelp Experiment Station, Summerland,Cal.

Dr.Berkeley of the Hercules Powder Company, San Diego,Cal. moght be able to give you the information desired concerning the treatment of kelp to save the cellular portion if by this you want simply the pulp.

The immediate outlook of the kelp industry is not particularly promising. The present methods are too expensivefor the industry to stay on its feet.

Yours truly

D. C. Collaborator.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS.
INVESTIGATION OF FERTILIZER RESOURCES.
EXPERIMENTAL PLANT FOR THE EXTRACTION OF POTASH FROM KELP.
SUMMERLAND, CALIFORNIA.

March 4, 1919.

Capt. W. C. Crandall,
Scripps Biological Institute,
La Jolla, California.

Dear Captain:

Ever since receipt of your kind favor of the 31st of December, transmitting the records of the Fish and Game Commission covering the Kelp harvests, I have had in mind taking up with you the question of preparing some sort of a formal report based on this data for publication in some suitable Journal. It seems that you are the logical man to write the report, although I will admit the possibility of your regarding me as such. At any rate, can't we get together on the matter and make it a joint report? or as a Bulletin of the U.S.D.A.

Possibly you have data in your possession which could be added to that supplied by the Fish and Game Commission, which could be used for elaborating such a report. Certainly you have a familiarity with the various beds which I haven't, which would make the preparation of such a report a very much easier matter than it would be if I undertook it.

Please let me have your opinion with regard to the advisability of such a paper and the possibilities of our working up something of such a nature as to be mutually creditable. I am sure the public would like to know something about the kelp yields.

Awaiting your reply with interest and with kindest personal regards,

Yours very sincerely,

J. W. Turrentine

In Charge.

JWT:ELB

THE SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH
OF THE
UNIVERSITY OF CALIFORNIA

LOCATED AT LA JOLLA
NEAR
SAN DIEGO, CALIFORNIA

LA JOLLA, CALIFORNIA,

Mar.5th 1919.

Dr.J.W.Turrentine,

Summerland,Cal.

My dear Turrentine:

You have the same hunch that I have had for several days and I have been figuring when I might be able to get up your way and go over the beds about Santa Barbara. I want to do this when the harvestor is working if possible. If you can drop me a line when I might be an acceptable visitor, I will try and get up and then go over the entire situation. Brandt is about ready for a report and I think that we can give something pretty good about now.

Yours

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS.
INVESTIGATION OF FERTILIZER RESOURCES.
EXPERIMENTAL PLANT FOR THE EXTRACTION OF POTASH FROM KELP.
SUMMERLAND, CALIFORNIA.

March 8, 1919.

Capt. W. C. Crandall,
Scripps Biological Institute,
La Jolla, California.

Dear Captain:

Replying to your esteemed favor of the 5th instant, permit me to say that I should be glad to see you up here at any time. It may be week after next, that is the week of the 17th, would be a better time since the "MayFlower", which we have added to our fleet, will be on the ways at San Pedro next week, but should be back the week following which would make her available for our use in going over the beds. We could probably get a better survey of them in the neighborhood from the "May Flower" than from the "Priestly" while cutting. However, we should be be glad to see you any time. At that time, then, we can go over the matter of the report on kelp yields.

With kind personal regards,

Yours very truly,

J. W. Turrentine
In Charge.

JWT:ELB

La Jolla, Cal.

Mar. 17th 1919

Chief, Bureau of Xoils,

Washington, D.C.

Dear Sir:

Reports received recently from Lower California indicate that the kelp beds from Cedros Island to Descanso Point are practically disappeared at this time. The large beds off Cape Colinet, San Geronimo Island and Todos Santos are all rotted off and boats are able to go without hindrance through any of them.

The Coastal Beds along So. Cal are showing but they are not strong yet. The plants are now growing well but show the time it takes for a bed that has undergone a year such as lat year to again get its strength back.

San Clomente Island kelp beds are in excellent shape. The beds are heavy and the plants show a high potash content.

Swift and Co. seem to be the only remaining company in the kelp game altho the "CaliNev Fertilizer Co." is going to use some kelp in its mixing plant at Los Angeles. It is going to get its kelp from Summerland. I am not sure but I think they must have bought the Occidental Company out.

Tomorrow I anticipate driving to Santa Barbara and go over with Dr. Turrentine the general situation here in So. Cal.

Yours truly

Collaborator.

Mar.28th 1919

Chief,Bureau of Soils,

Washington,D.C.

Dear Sirs

Last Tuesday/week I drove to Los Angeles and interviewed Mr.Ennis of the Pacific Products Company to see if there was any probability of his starting again either as he had been working or along the lines of the experiment at Summerland. He was quite positive that he would not as he said that he could only figure that he could get about 12% out of his former char. In other words he figures that it took one ton of wet to get a ton of ash and then of this ash he would only get 12% ash. He did not see that he would take a chance on the situation.

I was unable to see Mr.Hudson but apparently he not making any move at Long Beach. All of his beach burners have quit and he is quiescant at least.

On Wednesday I was in Santa Barbara and went over all the work that has been doen during the last 18 mos. Particularly I took up with Dr. Turrentine the desireability of completeing the present work in hand there and the bringing into one document all that has been found out since #190 and #100 were printed. I have available a paper by my assistant Dr.Brandt on the growth and developement of the plant as well as a start of a paper on the "tTaxonomy of Macrocystis" Also all of the tabulations of the various trips that both he and I have made and the cycles and periods that are now beginning to show as a result of the continued observation.

The work obtained from Hercules Powder Company is also a work that I feel should be placed in permanent form and as the material is available

now, the opportunity shoudd be taken to put the work in permanent while the details are still held in mind by the men who performed the work if the present information should prove incomplete.

The condition of kelp beds is as follows

San Diego- La Jolla	Beds #3 ,4.	Medium. Plants growing well but no mat. Being cut by Swift.	
Del Mar- San Juan Pt.	Beds # 5 -9	Medium. Plants growning well. No mat. #9 partially cut r recently by Swift.	
San Pedro	#11,12	Heavy	No old mat.
Ventura,Gorda	18,19	Thin	Old dark plants
Carpenteria	20	Medium	Young Plants
Summerland	21	Medium	Young Plants
Santa Barbara-Naples	22 to 28	Medium	Young Plants
Capitan-Gaviota	29 30	Heavy	Young Plants No Mat.
San Clemente Is.	43-45	Heavy	Young Plants. Being cut by Swift during Feb. & early March.

I saw personally all the above beds except San Clemente.

After going over the work th t Dr.Turrnetine is doing, it does seem that it would be rather a calamity to our kelp investigation work to have to give up the experimental work at Summerland just at this point. As most of the companies have given up the industry, it seems to me most important that the remaining work be seen through to its completion. It means a great deal to lose an industry such as the kelp industry appeared to become without making extra efforts to see if a portion might not be continued to commercial advantage.

I am now watching the kelp beds with the view of seeing how they are going to act if a normal years ocean temperature ~~appears~~ appears this year. Also we can be able to know now how long it takes a mat of old plants to appear.

Very sincerely yours

M C Landacre

Collaborator.

General Report on San Pedro Trip, May 3rd, 1919.

by

R. P. Brandt.

Kelp Beds: Based in part on Mr. Nidever's report.

Santa Barbara – Rather thin, U.S.D.A. harvesting.

15 & 16 – In good shape.
11 & 12 – Heavy, growing rapidly.
9 – Medium, in good condition.
8. – Thin, " " "
7. – Medium, reported quite heavy.
6. – Heavy
5 – No report.
4. – Heavy near inner edge, remainder medium to thin, laminae thin – growth poor.

Kelp reported to be coming back well from Oceanside to Pt. Dume. "Fishing boats again able to lie behind kelp beds near Oceanside." – Nidever.

Breakwater:

Tufts of Egregia in crevices, etc., up to 2 ft. tall where rocks were bare in February, Macrocystis plants up to 12 or 14 in. tall in such places.

Plant not large enough in Nov. or Dec. to be recognized as Macrocystis now with fronds having stipes of medium weight, forming numerous hapteres, one sorus on basal sporophyl.

Table: Based on observations in lab., on breakwater – beaches.

Spore to visible plant – 3 mo. or less.
Visible plant to first mature spores – 5 mo. or less.
Spore to stipes of average diameter – 8 mo. or less.
Spore to commercial yield – 10 mo. or less.

Relation between summer ocean temperatures and amount of rainfall for the ensuing season in Southern California.

Year	Ocean temperature departures at Scripps Inst. Pier.												Rainfall departures in inches.		
	July			August			September			October			San Diego	San Luis Obispo	Los Angeles
	M*	L	H	M	L	H	M	L	H	M	L	H			
1916	-2.0	-3.1	-2.7	-2.3	-4.5	+0.5	-2.2	-4.9	-3.6	-3.8	-5.4	-3.6	+1.16	+3.30	+2.69
1917	+1.4	+1.6	+2.9	+1.3	+2.3	-0.5	+0.9	+0.5	+3.2	+0.5	-0.2	-0.2	-0.93	-1.67	+1.29
1918	+0.5	+1.4	0.0	+1.3	+2.0	-0.2	+1.4	+4.1	+0.4	+3.1	+5.4	+3.6	-0.23	-1.64	-3.99
1919	+1.3	-0.5	+3.2	-0.7	-3.1	-2.5	-1.3	-0.2	-2.0				?	?	?

*The average of the mean monthly temperatures at the Scripps Inst. Pier for the three seasons 1916, 17 and 18, combined, subtracted from the mean monthly value for each year is the temperature departure entered under M. The departure of lowest temperature for each month from the mean of the lowest temperatures for the same three seasons is entered under L. Similarly, the departure of the highest temperatures is entered under H.

A comparison of these departures with rainfall departures, determined in the same way for the ensuing season, indicates that low temperatures (negative departures) precede large seasonal rainfalls (positive departures) and vice versa.

Accordingly this summer's condition indicates a deficient rainfall for 1919-20.

PLEASE ADDRESS ALL COMMUNICATIONS TO THE COMPTROLLER

UNIVERSITY OF CALIFORNIA
OFFICE OF THE COMPTROLLER

RALPH P. MERRITT, COMPTROLLER
ROBERT G. SPROUL,
ASSISTANT TO THE COMPTROLLER

H. H. BENEDICT, ACCOUNTANT
N. HOVEY, PURCHASING AGENT
H. B. FOSTER, ENGINEER

Berkeley, May 27, 1919.

Mr. W.E. Crandall,
Scripps Institution,
La Jolla,
California.

My dear Mr. Crandall:

With reference to your letter of May 15, I am somewhat puzzled by Mr. Scripps generous offer to invest $20,000 in building ten cottages at La Jolla. How would these cottages compete with those already completed. What is the nature of the fund which he proposes to use; that is to say, is it a trust fund, or is it his own money? Would he be willing that you should pass upon the desirability of all persons who should live in the houses. I would like to talk it over with you sometime, if you think it is really of importance that we should embark on a new complication.

I hope you are feeling well again.

Very sincerely yours,

Ralph Merritt

August 22, 1919.

Chief Bureau of Soils,
Washington, D. C.

Dear Sir:

Your letter of authorization No. 65-So, dated July 1st, 1919, is at hand, and will be used for the purposes designated.

At this time I will make a preliminary report upon a trip made during the latter portion of July along the coast from San Diego to Point Conception. The trip was made for the purpose of ascertaining the condition of the kelp beds, and also for the purpose of having a conference with Dr. Turrentine concerning the possibility of the Bureau of Soils publishing an article which has been written by Dr. R. P. Brandt from materials derived during the last seventeen months in his work at the Scripps Institution.

I found the conditions of the beds as follows:

Bed No. 2.	Thin
Bed No. 3	Medium
Beds No. 4,5	Very thin.
Beds No. 6,7,8	Medium
Beds No. 9,10	Medium
Bed No. 11	Medium
Bed No. 12	Heavy
Bed No. 13	Heavy
Bed No. 18	Thin
Beds No. 19, 20,21,22,23	Thin
Beds No. 25, 26,27,28	Very heavy.
Bed No. 29	Thin
Bed 30	Very heavy
Bed 31	Medium.

Also I have to report that the kelp beds from Cedras Island to Point of Rocks are just beginning to show so that boats running over those courses are now able to make out the outlines of the kelp beds, but well-matted and well-formed beds have not yet developed. These beds have constantly been in poor shape for over a year, in fact apparently in poorer shape than the bed No. 4 has been, and this bed has shown the poorest condition of any of the Southern Californiabeds. Temperature conditions this summer still show a high range, and from what I can learn along the coast, the beds from nos. 18 to 25 have thinned out during the month of July, and that previous to this time they were in at least heavy condition.

I am more and more of the opinion that the high temperatures which have been prevailing during this summer and the previous three summers, are the prime factors in causing this poor growth of kelp that we are having along the California coast. The indirect evidence that I have received in exposed coast, such as along the Channel Island seems to be that these beds are still retaining their strength and virility, while the beds inshore are unable to withstand the temperatures of the water during the summer seasons. This deduction can not be considered final until we have a summer when the temperatures run lower than they have in recent years. Throughout this district we are short on rain fall, and have been for three years, so that there may be some very close connection bptween meteorological condition and this growth of kelp.

On August 12, I looked over the kelp beds as far as San Pedro and found that they were the same as before, with this exception, that bed No. 6, 7 and 8 had become poor, otherwise, conditions as on the previous trip.

The character of the paper which has been written by Dr. Brandt, under my supervision, contains the following salient points:

The study of sub-strata
The study of the depth
The study of the temperature, with tables
The study of winds and tables
The study of wave action
The study of storms, with table.
The study of light relationships
The study of the growth
The study of the lifecircle of an individual frond
The study of extensive disappearance
The study of Black Rock
The study of harvesting
General summary
Life history
Bibliography
Table on comparative harvesting of kelp
Table on seasonal condition of kelp beds
Figures showing the various stages in the development of kelp.

This paper I submitted to Dr. Turrentine at Santa Barbara, and he thought very favorably of it. We considered the advisability of getting out all the present available material on kelp which has been obtained since report 100 was put out. This material will comprise

A paper on the work of the kelp investigation at Summerland
The digest of the reports of the Hercules Powder Co.
The paper by Dr. Brandt and myself, and
The paper by myself on the history of kelp plants and kelp beds of Southern California.

This would seem to give information which might in the future be of great value and prevent someone else having to do many of the things that we have been working on since 1910. To my mind there is no doubt but that there will from now on always be some form of activity in the kelp business and that we have now simply a temporary lull because the materials gotten from the kelp were needed specifically for war or allied purposes, but that in the future there will be on great or larger scales a development of small industries which will undoubtedly manufacture chemicals for the drug trade.

Will you be interested in seeing the draft of the paper by Dr. Brandt, and also interested in the placing of the other material in permanent form?

It has seemed to me that as the Bureau of Soils has fathered and practically done all of the work in the kelp industry, so far as public institutions are concerned, that this material that I have outlined above, would be most and best available if put out by the Department. I do not know how else the material might be put out, as no other public institution seems available for this purpose.

Very sincerely yours,

Collaborator.

WCC.G

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
WASHINGTON, D. C.

ADDRESS ALL COMMUNICATIONS TO
CHIEF, BUREAU OF SOILS.

ROED:MM

August thirty,
1919.

INVESTIGATION OF FERTILIZER RESOURCES.

Mr. W. C. Crandall,

La Jolla, Cal.

Dear Sir:

I beg to acknowledge receipt of yours of the 22nd regarding the survey you have made of the kelp beds from San Diego to Point Conception. I think it would be a desirable thing to publish as one report the work done on kelp since the issue of report 100. I should be very glad to see a draft of the paper by Dr. Brandt and I think it would be advisable to have all of the material mentioned prepared in form for publication as a report. After this is done, we will then take up the matter of publication on submitting the material to the Secretary's office.

Very truly yours,

Milton J. Whitney

Chief of Bureau.

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS.
INVESTIGATION OF FERTILIZER RESOURCES.
EXPERIMENTAL PLANT FOR THE EXTRACTION OF POTASH FROM KELP.
SUMMERLAND, CALIFORNIA. September 24, 1919.

Scripps Biological Institute,
La Jolla, California.

Gentlemen:

We are today in receipt of original of Government bill of lading on which you shipped us a microscope on September 23rd. Will you please also send us the memorandum copy? Our Washington office requires this for their files.

Very truly yours,

Earl L. Beaulieu

Disbursing Agent

ELB:JWH

UNITED STATES DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS.
INVESTIGATION OF FERTILIZER RESOURCES.
EXPERIMENTAL PLANT FOR THE EXTRACTION OF POTASH FROM KELP.
SUMMERLAND, CALIFORNIA. September 25, 1919

Scripps Biological Institute,
La Jolla, Calif.

Gentlemen:

We are today in receipt of your letter of the 22nd instant asking us to sign receipt for the microscope which you have so kindly loaned us. The miscroscope arrived this afternoon in good shape, and signed receipt is enclosed.

Again thanking you for your courtesy in this matter,

Very truly yours,

David A. Shoaff
Manager of Operations

B:H

THE SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH
OF THE
UNIVERSITY OF CALIFORNIA

LOCATED AT LA JOLLA
NEAR
SAN DIEGO, CALIFORNIA

LA JOLLA, CALIFORNIA,

Sept. 22nd 19[illegible]

Received as a loan the following from the Scripps Institution for Biological Research which it is agreed will be returned in as good condition as received by May 1st 1920:

1 Compound Mocroscope	B & L #110747	
Oculars	#5	#10
Objectives	4mm	16mm
Double nose piece		
Condenser		

1 phamplet on Use and Care Microscope.

U. S. Bureau of Soils,

by R. L. Howes

Summerland, California.

To be filed at Scripps Institution, La Jolla.

Kelp Beds - Condition

November 12, 1919.

Chief, Bureau of Soils,
Washington, D. C.

Dear Sir:

During October I had an opportunity to observe from shore line, the kelp beds from San Diego to San Francisco, and I find they are in the following condition:

Beds 3, 4, and 5,	are heavy, but the width is somewhat reduced over previous years.
Beds 6, 7, and 8,	are medium
Beds 9,10, and 11	are heavy.
Beds 12,13,14	very heavy.
Bed 22	medium
Bed 23	thin
Bed 24	thin
Beds 25,26,27,28	medium
Beds 29 and 30	heavy.

These numbers are according to the kelp bed numbers of the State of California.

Also in case of beds in and about Monterey and Santa Cruz, found at Santa Cruz a small bed of mature Nerocystis plants; at Moss Beach, below Monterey, also small beds of mature Nerocystis plants; at Point Joe, south of Moss Beach, a medium bed of mature plants; Cypress Point, medium bed, and at Carmel, a heavy bed of Nerocystis. The striking thing that I noticed was the comparatively greater acreage or area of our southern beds as compared to the northern beds, and the greater observed distance of all of the northern beds, from the shore than any of the northern beds.

Last week I examined the lee side of the breakwater at San Pedro for small plants, but was unable to find any developing at this time. I hope that by the end of this year we will have the probable period of growth very well in hand. This will make three years for this study.

Very truly yours,

WCC/C

Kelp

Nov.21st 1919

Drift kelp in from kelp beds. Brought by northerly current.

Many Palagophycus plants

Small 1 3/4" dia,eter bulbs.

Mature 8" many.

Macrocystus plants. No holdfasts.

No sporophylls.

UNITED STATES FOOD ADMINISTRATION
Office Fish Commissioner, Southern California

DAILY FISH REPORT

Forward slips of preceding week to
W. C. CRANDALL, Fish Commissioner
Southern California, La Jolla, Cal.

_____ 1918

S. U.—Unlimited catch Sardines.
S. L.—Quarter Oil Sardines.
T.—Tuna. S. B.—Sea Bass.
Y.—Yellowtail. R. C.—Rock Cod.
M.—Mackerel. A.—Albacore.

_____ *Dealer or Cannery*

Name of Boat	Kind of Fish	Pounds Catch	Price	Pounds Fertilizer	Price

December 13, 1919.

Chief Bureau of Soils,
Washington, D. C.

My dear Sir:

This is to advise you that Charles F. Tanner, representing the American Potash & Fertilizer Company, Inc. is contemplating the erection of a plant along the coast, which will attempt to use kelp for the obtaining of bi-products by methods which are being determined by the Federal Experimental Station at Summerland, California.

Mr. Tanner is one of the men who was in the old American Potash, Inc. and who is now attempting to interest eastern capital in this new development. I would call your attention to the fact that Mr. Tanner himself lost considerable money in the American Potash, Inc., but at the same time he was not overly conscientious in his dealings with other men in getting them to get stock in that same company, even after their methods had been proved to be practically failures.

Very truly yours,

WCC/G

Collaborator.

Kelp Supply

Redondo Beach Cal 12-29-19

Gentlemen Biological Dpt. La Jolla Cal

I am in search of information, on the manner of propogation of the kelp plant. I refer to that variety known as field kelp which has existed in large areas along the shores but has been mostly destroyed and removed by the reapers of the Potash Companies

Between Clifton By the Sea (near Redondo Beach) and Pt Firmin the kelp beds covered an area of approximately two square miles. Nothing now remains but scattering fragments and the old stumps.

We often hear the assertion that the kelp will grow up again in 6 months. Cutting began in June last and I have been watching in vain for new growth

I believe the authorities are in error in permitting this destruction to continue, and I intend to send a protest to the Co. Supervisors, but I am not sure that my impression is right - so I come to you for knowledge. There being no lateral buds and no latent buds and I believe no sprouts from the roots I

can see no possible way for new growth except from spores - These of course must find lodgement in suitable places and grow up from the bottom each as a single plant. I have been a commercial fisherman on this Coast for the last 26. years. From observation I believe the kelp plants to be very long lived and of slow growth

There was an area of possibly 20 acres, just outside the field kelp, covered with the floating top of the Giant Kelp. the large bulb variety. This was all harvested 6 years ago for a Curio Mfg Co. As yet no new growth of the grant kelp has appeared above the water, but we know there is a new growth coming as we get our lines and trap ropes fast and pull up the big plants occasionally

Briefly my question is, does the plant propogate from root sprouts - or from spores? the ~~fie~~ field kelp variety.

Most Respectfully Yours

J. W. Foote

Redondo Beach